REMARKS

Claims 1,2 and 4-7 are currently in the case.

Rejections under 35 USC §112 Second Paragraph.

A) Applicants submit that the term "amu" as used in the instant application is not indefinite, amu being well known in the art as number average molecular weight. If the Examiner will allow the indulgence of Applicant this information will be included in the specification in an effort to meet the indefiniteness objection.

In the instantly claimed invention the term "about" refers to both the first and second values in the range of molecular weights; the term "about" has been added by amendment before the second value of 100,000 in claim 1.

B) 1. Applicants respectfully traverse the rejection of claim 2 under 35 USC § 112 second paragraph. The term "acrylamidomethyl sulfonate" does not occur in claim 2.

2. The term "acrylamidomethyl sulfonate" in claims 4 and 6 has been amended to " acrylamido-2-methyl propane sulfonic acid". Support for the amendment may be found on page 5, lines 15 and 16 of the specification.

C) Claim 5 has been amended to include the defining term "amu" to clearly define the molecular weight by amending the claim to recite " from about 2000 to about 20,000 amu".

D) Claims 4 and 6 have been rewritten to obviate the antecedent rejection to reflect that the instantly claimed polymers are derived from the recited vinyl monomers. Support can be found for the amendment on page 4, line 14 of the specification.

Rejection under 35 USC §103(a)

Claims 1, 2 and 4-7 stand rejected as obvious as being unpatentable over Horsley et al., USP 4, 688, 588 in combination with Brown et al., USP 5, 317, 053.

Horsley et al. teaches that the flow properties (e.g. viscosity and settling rates) of concentrated silica slurries containing certain types of impurities, e.g. "fines" (these slurries are typical of the mining industry) may be modified by adding certain soluble inorganic and organic additives, such as "a naphthalene sulphonate aminoplast polymer." Horsely et al. discloses at column 2, line 12-14 that the settling rate of slurry particles decreases as the impurity content increases. Thus, the addition of the disclosed additives negates the effects of impurities, causing

a substantially instantaneous decrease in the yield stress and viscosity of the slurry in flow. Said another way, these additives make a silica slurry that contains impurities unstable, i.e. flow more readily. Horsley is silent on the long-term aging stability of slurries containing naphthalene sulphonate aminoplast polymer additives.

Brown et al. teaches a method for the production of a high solids aqueous slurry of particulate calcium carbonate having highly stable aging characteristics, i.e. long term viscosity stability (i.e. non-settling characteristics), comprising dispersing in water at least 70% by weight solids of a finely divided particulate calcium carbonate and utilizing as a dispersing agent various quantities of a copolymer of acrylic acid and a sulfonated vinyl monomer, which is converted to the salt form by from about 30 to 50% of its carboxylic acid sites being neutralized with a polyvalent cation and the balance of the carboxylic sites being neutralized with a monovalent cation.

In contrast, the instant invention comprises a method for modifying the rheology of a slurry of a mineral-containing solid material and water, wherein the mineral-containing solid material is nickel ore, cobalt ore, precious metals ore, copper ore, taconite, mineral sands, coal, bauxite or a mixture thereof, the method comprising adding to the slurry a sulfonate-containing polymer wherein the polymer is prepared by polymerization of vinyl monomers containing a sulfonate functional group with an amu ranging from about 2,000 to about 100,000.

Applicants submit, as previously argued, that the combination of Brown et al. with Horsley et al. is improper, as there is no implicit or explicit motivation to combine these references. Moreover, it is respectfully submitted that the references when read carefully actually teach away from what the instant invention claims. Horsley et al. is specific in regard to the type of organic dispersant useful to reduce the stability of his slurry: a naphthalene sulphonate aminoplast polymer. No other type of material is disclosed or suggested. As clearly described in Applicant's previous response, naphthalene sulphonate aminoplast polymers are structurally dissimilar to those of the instantly claimed polymers. Brown et al. only teaches that his vinyl-derived polymers increase the long-term storage stability of calcium carbonate slurries. In neither of these cites references is there a nexus which would lead the skilled artisan to attempt to substitute the polymers of Brown et al. into the slurry of Horsley et al. with any expectation of success. In view of these two disclosures, it is submitted that one of ordinary skill in the art would not know or be able to ascertain through either disclosure taken alone or in combination

that a vinyl addition polymer containing a sulfonate group (which increases long term stability of the slurry) would decrease the yield stress and increase the settling rate of Horsley et al.'s silica and impurity-contain slurry. Applicants contend that such in not the case absent some probative evidence. Further, in view of the above comments, it is submitted that Horsley et al. teaches away from attempting the modification as suggested and nowhere teaches or suggests long term storage stability being imparted to a slurry. Horsley et al. is directed to making silica and impurity-containing slurries that flow more easily, nothing more. Brown et al. is directed to making calcium carbonate containing slurries non-settling over long periods of time. Furthermore, even if the combination of these two references were permissible it would be difficult to determine exactly why one skilled in the mining arts (which is clearly the field of technology of Horsley) would look to the papermaking art (the technology of Brown) to combine these references. It is submitted that the combination for these two references is the result of the impermissible use of hindsight. There is no discernable reason explaining why one attempting to solve the rheology problem of Horsley would even think to look at art in the art of papermaking technology to solve the problem as set forth and solved by the instantly claimed method.

In view of the aforesaid amendments and arguments it is respectfully submitted that the obviousness rejections should fall. No new matter is believed to have been added on entry of this amendment. Favorable reconsideration and early notice of allowance is respectfully requested.

Respectfully submitted,

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MARKED-UP VERSION OF AMENDED CLAIMS

1. (Three Times Amended) A method for modifying the rheology of a slurry of a mineral-containing solid material and water, wherein the mineral-containing solid material is nickel ore, cobalt ore, precious metals ore, copper ore, taconite, mineral sands, coal bauxite or a mixture thereof, the method comprising adding to the slurry a sulfonate-containing polymer wherein the polymer is prepared by polymerization of vinyl monomers containing a sulfonate functional group with an amu ranging from about 2,000 to about 100,000.

4. (Once Amended) The method of claim 1 wherein the polymer comprises repeat units derived from acrylamide, acrylic acid and [acrylamidomethyl] acrylamido-2-methyl propane sulfonate monomers.

5. (Once Amended) The method of claim 1 wherein the polymer is further characterized as having a molecular weight ranging from about 2,000 to about 20,000 amu.

6. (Once Amended) The method of claim 1 wherein the polymer is further characterized as comprising repeat units derived from about 3 to about 40 mole% [acrylamidomethyl] acrylamido-2-methyl propane sulfonate monomer, from about 5 to about 45 mole% acrylamide monomer and from about 30 to about 70 mole% acrylic acid monomer.

7. (Once Amended) The method of claim 1 wherein the polymer is further characterized as comprising repeat units derived from about 5 to about 10 mole% [acrylamidomethyl] acrylamido-2-methyl propane sulfonate monomer, from about 30 to about 40 mole% acrylamide monomer and from about 55 to about 65 mole% acrylic acid monomer.